



Agilent Technologies

AGILENT TECHNOLOGIES
INTERNAL ASSESSMENT
PROGRAM : EMG
E102/1995

EMG Support Operation
10090 Foothills Blvd.
Roseville, CA. 95747
(800) 829-4444

Certificate of Calibration
Agilent Calibration
Certificate Number: 1-2396764563-1

Manufacturer:	Agilent Technologies, Inc.	Description:	Digital Multimeter, 6.5 Digit
Model Number:	34401A	Options Installed:	
Serial Number:	US36043788	Customer Asset No:	
Customer:		Location of Calibration:	
Oregon State University		EMG Support Operation	
130 Burt Hall		10090 Foothills Blvd.	
CORVALLIS OR 97331		Roseville, CA. 95747	
UNITED STATES		(800) 829-4444	
Procedure:	STE-50111013-C.01.11	Customer PO Number	
Date of Calibration:	11 Jan 2010	Humidity:	(50 +/- 30)% RH
Temperature:	(23 +/- 5) °C		

This certifies that the above product was calibrated in compliance with a quality system registered to ISO 9001:2008 using applicable Agilent Technologies procedures.

Agilent Technologies Roseville Service Center is accredited to ISO/IEC 17025:2005, certificate # 1920-01. Please contact us for Accredited Calibrations.

As Received Conditions:

Initial testing found the equipment to be **IN-SPECIFICATION** for the parameters tested. The instrument was adjusted to **OPTIMIZE** the performance as recommended for this model.

As Shipped Conditions:

At the completion of the calibration, measured values were **IN-SPECIFICATION** for the parameters tested.

Remarks or Special Requirements:

Our calibration procedures are designed to provide measurement uncertainty of less than or equal to one quarter of the specification of the unit under test, where possible, with a coverage factor of 2.

The test limits stated in the report correspond to the published specifications of the equipment, at the points tested.

This certificate is composed of 2 pages containing a summary of calibration information.

Based on the recommended calibration interval, the next calibration is due on 11 Jan 2011.

Larry Goins Engineering Manager

Print Date: 11 Jan 2010



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Traceability Information:

Technician ID Number: 813497

Traceability is to national standards administered by the U.S. NIST, NRC Canada, Euromet members (NPL, PTB, BNM, etc.) or other recognized standards laboratories.

Some measurements are traceable to natural physical constants, consensus standards or ratio type measurements.

Supporting documentation relative to traceability is available for review by appointment.

This certificate shall not be reproduced, except in full, without prior written approval of the laboratory.

Calibration Equipment Used:

Model Number:	Model Description:	Trace Number:	Cal Due Date:	Certificate Number:
5720A	Multifunction Calibrator	5720A60202	6 May 2011	1-2310313182-2
33250A	Function/ARB Waveform Generator	33250A05005	8 Jul 2010	1-1848111929-1
5725A	Amplifier	5725A90005	6 May 2011	1-2310313182-1



Agilent Technologies

Customer Service Report

Customer Purchase Order Number S1180A	
Service Order Number 1-2396764563	Date Received 08-Jan-2010

Attention: David Ogorman
Ship To:
Oregon State University
130 Burt Hall
CORVALLIS OR 97331
United States

Telephone: (541) 737-1504

Please Direct Inquiries To:
Customer Contact Center
Telephone: 800-829-4444

Problem Description:
Agilent Calibration (Pre and Post Data) (Available as standalone cal only)
Cal Interval: 12 months /
Standalone or System: standalone
Service Note Firmware Permission: No, please contact me before performing either. /
Installed Options: /
Special Requirements:

Product Number/ Description	Manufacturer	Serial Number
34401A Digital multimeter, 6.5 digit	Agilent Technologies Inc	US36043788
Parts Used:		Quantity:

Services Provided:
Cleaned and calibrated to manufacturer's specifications. Calibration certificate and data provided.



Measurement Report (As Received)

Report Number: 1-2396764563-1	Test Date: 11 Jan 2010
Model Number: HP34401A	
Serial Number: US36043788	

ZERO OFFSET - FRONT TERMINALS

PASSED

Pre-Repair/Adjustment Data:

TEST CONDITIONS		MINIMUM	MEASURED	MAXIMUM
DC Volts Zero Offset				
Range	Input (Front)			
-----	-----			
100 mV	0 V	-3.5	-0.8 uV	3.5
1 V	0 V	-7	0 uV	7
10 V	0 V	-0.05	0.00 mV	0.05
100 V	0 V	-0.6	0.0 mV	0.6
1000 V	0 V	-10	0 mV	10
4-Wire Ohms Zero Offset				
Range	Input (Front)			
-----	-----			
100 Ohm	0 Ohm	-4.0	-1.0 mOhm	4.0
1 kOhm	0 Ohm	-10	-1 mOhm	10
10 kOhm	0 Ohm	-0.10	-0.01 Ohm	0.10
100 kOhm	0 Ohm	-1.0	-0.1 Ohm	1.0
1 MOhm	0 Ohm	-10	0 Ohm	10
10 MOhm	0 Ohm	-0.10	0.00 kOhm	0.10
100 MOhm	0 Ohm	-10.0	0.0 kOhm	10.0
2-Wire Ohms Zero Offset				
Range	Input (Front)			
-----	-----			
100 Ohm	0 Ohm	-204.0	-3.2 mOhm	204.0
1 kOhm	0 Ohm	-210	-3 mOhm	210
10 kOhm	0 Ohm	-0.30	-0.01 Ohm	0.30
100 kOhm	0 Ohm	-1.2	0.0 Ohm	1.2
1 MOhm	0 Ohm	-10	1 Ohm	10
10 MOhm	0 Ohm	-0.10	0.00 kOhm	0.10
100 MOhm	0 Ohm	-10.0	0.0 kOhm	10.0
DC Current Zero Offset				
Range	Input (Front)			
-----	-----			
10 mA	0 A	-2.00	0.04 uA	2.00
100 mA	0 A	-5.0	0.0 uA	5.0
1 A	0 A	-100	0 uA	100
3 A	0 A	-600	3 uA	600

Measurement Report (As Received)

Report Number: 1-2396764563-1
 Model Number: HP34401A
 Serial Number: US36043788

Test Date: 11 Jan 2010

DC VOLTS

PASSED

Pre-Repair/Adjustment Data:

TEST CONDITIONS		MINIMUM	MEASURED	MAXIMUM
Range	Input (Front)			
-----	-----			
100 mV	100 mV	99.9915	99.9998 mV	100.0085
1 V	1 V	0.999953	1.000001 V	1.000047
10 V	10 V	9.99960	9.99999 V	10.00040
10 V	-10 V	-10.00040	-10.00000 V	-9.99960
100 V	100 V	99.9949	100.0008 V	100.0051
1000 V	1000 V	999.945	999.978 V	1000.055

AC VOLTS

PASSED

Pre-Repair/Adjustment Data:

TEST CONDITIONS		MINIMUM	MEASURED	MAXIMUM
100 mV Range	Input Freq.			
(Front)				
-----	-----			
10 mV	1 kHz	9.9540	10.0005 mV	10.0460
100 mV	1 kHz	99.9000	100.0056 mV	100.1000
100 mV	50 kHz	99.8300	100.0086 mV	100.1700
1 V Range	Input Freq.			
(Front)				
-----	-----			
1 V	20 Hz	0.999100	0.999835 V	1.000900
1 V	1 kHz	0.999100	1.000008 V	1.000900
1 V	20 kHz	0.999100	0.999996 V	1.000900
1 V	50 kHz	0.998300	0.999813 V	1.001700
1 V	100 kHz	0.993200	0.999622 V	1.006800
1 V	300 kHz	0.955000	1.000547 V	1.045000
10 V Range	Input Freq.			
(Front)				
-----	-----			
100 mV	1 kHz	86.94	100.40 mV	113.06
1 V	1 kHz	0.99640	0.99984 V	1.00360
10 V	10 Hz	9.99100	10.00041 V	10.00900
10 V	1 kHz	9.99100	9.99953 V	10.00900
10 V	50 kHz	9.98300	9.99584 V	10.01700
100 V Range				

Measurement Report (As Received)

Report Number: 1-2396764563-1
 Model Number: HP34401A
 Serial Number: US36043788

Test Date: 11 Jan 2010

OHMS CONTINUED

TEST CONDITIONS		MINIMUM	MEASURED	MAXIMUM
1 MOhm	1 MOhm	0.999890	0.999983 MOhm	1.000110
10 MOhm	10 MOhm	9.99590	9.99955 MOhm	10.00410
100 MOhm	100 MOhm	99.1900	100.6241 MOhm	100.8100

DC CURRENT PASSED

Pre-Repair/Adjustment Data:

TEST CONDITIONS		MINIMUM	MEASURED	MAXIMUM
Range	Input (Front)			
10 mA	10 mA	9.99300	10.00000 mA	10.00700
100 mA	100 mA	99.9450	99.9993 mA	100.0550
1 A	1 A	0.998900	0.999964 A	1.001100
3 A	2 A	1.99700	1.99993 A	2.00300

AC CURRENT PASSED

Pre-Repair/Adjustment Data:

TEST CONDITIONS		MINIMUM	MEASURED	MAXIMUM
1 Amp Range	Input Freq. (Front)			
10 mA	1 kHz	8.590	9.948 mA	11.410
1 A	1 kHz	0.998600	1.000091 A	1.001400
3 Amp Range	Input Freq. (Front)			
2 A	1 kHz	1.99520	1.99948 A	2.00480

Report Number: 1-2396764563-1	Test Date: 11 Jan 2010
Model Number: HP34401A	
Serial Number: US36043788	

ZERO OFFSET - REAR TERMINALS

PASSED

Zero Offset Adjustments DONE

Post-Repair/Adjustment Data:

TEST CONDITIONS		MINIMUM	MEASURED	MAXIMUM
DC Volts Zero Offset				
Range	Input (Rear)			
-----	-----			
100 mV	0 V	-3.5	-0.2 uV	3.5
1 V	0 V	-7	0 uV	7
10 V	0 V	-0.05	0.00 mV	0.05
100 V	0 V	-0.6	0.0 mV	0.6
1000 V	0 V	-10	0 mV	10
4-Wire Ohms Zero Offset				
Range	Input (Rear)			
-----	-----			
100 Ohm	0 Ohm	-4.0	0.1 mOhm	4.0
1 kOhm	0 Ohm	-10	0 mOhm	10
10 kOhm	0 Ohm	-0.10	0.00 Ohm	0.10
100 kOhm	0 Ohm	-1.0	0.0 Ohm	1.0
1 MOhm	0 Ohm	-10	0 Ohm	10
10 MOhm	0 Ohm	-0.10	0.00 kOhm	0.10
100 MOhm	0 Ohm	-10.0	0.0 kOhm	10.0
2-Wire Ohms Zero Offset				
Range	Input (Rear)			
-----	-----			
100 Ohm	0 Ohm	-204.0	-0.1 mOhm	204.0
1 kOhm	0 Ohm	-210	0 mOhm	210
10 kOhm	0 Ohm	-0.30	0.00 Ohm	0.30
100 kOhm	0 Ohm	-1.2	0.0 Ohm	1.2
1 MOhm	0 Ohm	-10	0 Ohm	10
10 MOhm	0 Ohm	-0.10	0.00 kOhm	0.10
100 MOhm	0 Ohm	-10.0	-0.2 kOhm	10.0
DC Current Zero Offset				
Range	Input (Rear)			
-----	-----			
10 mA	0 A	-2.00	-0.08 uA	2.00
100 mA	0 A	-5.0	-0.1 uA	5.0
1 A	0 A	-100	-2 uA	100
3 A	0 A	-600	-3 uA	600

Report Number: 1-2396764563-1	Test Date: 11 Jan 2010
Model Number: HP34401A	
Serial Number: US36043788	

AC VOLTS

CONTINUED

TEST CONDITIONS		MINIMUM	MEASURED	MAXIMUM
10 V	10 Hz	9.99100	10.00014 V	10.00900
10 V	1 kHz	9.99100	10.00002 V	10.00900
10 V	50 kHz	9.98300	9.99825 V	10.01700
100 V Range				
Input Freq.				
(Front)				

100 V	1 kHz	99.9100	99.9996 V	100.0900
100 V	50 kHz	99.8300	100.0043 V	100.1700
750 V Range				
Input Freq.				
(Front)				

700 V	1 kHz	699.355	699.997 V	700.645
700 V	50 kHz	698.785	700.161 V	701.215
700 V	45 Hz	699.355	699.915 V	700.645

FREQUENCY

PASSED

Frequency Gain Adjustments DONE

Post-Repair/Adjustment Data:

TEST CONDITIONS		MINIMUM	MEASURED	MAXIMUM
100 mV Range				
Input Freq.				
(Front)				

10 mV	100 Hz	99.9000	99.9960 Hz	100.1000
1 V Range				
Input Freq.				
(Front)				

1 V	100 kHz	99.9900	100.0000 kHz	100.0100

OHMS

PASSED

Measurement Report (As Completed)

Report Number: 1-2396764563-1	Test Date: 11 Jan 2010
Model Number: HP34401A	
Serial Number: US36043788	

AC CURRENT

CONTINUED

<u>TEST CONDITIONS</u>		<u>MINIMUM</u>	<u>MEASURED</u>	<u>MAXIMUM</u>
10 mA	1 kHz	8.590	9.975 mA	11.410
1 A	1 kHz	0.998600	1.000094 A	1.001400
3 Amp Range				
Input Freq.				
(Front)				

2 A	1 kHz	1.99520	1.99958 A	2.00480